(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(54) Title: METHOD AND APPARATUS FOR PACKET DATA SERVICE DISCOVERY

(57) Abstract: A method and apparatus for packet data service discovery are described. A current blacklist comprising entries for
wireless networks not providing packet data services (i.e. either not supporting the services or not having a packet data services
roaming agreement) is kept in memory of the mobile device based on previous attempts to connect to such networks. Current pre-
ferred roaming lists identify whether a given wireless network can be acquired, but do not identify whether a data services roaming
agreement exists. At least one of the following advantages is provided: no advance knowledge of data services roaming agreements
is required; no mobile device software change is required when the data services roaming agreement changes; mobile device can
notify a server of a wireless network status change; significant power savings at the mobile device; and avoid unnecessary network
access, which in turn saves network resources and capacity.

IN THE EUROPEAN PATENT OFFICE
International Preliminary Examination Authority

Applicant: Research in Motion Limited et al.

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Title: METHOD AND APPARATUS FOR PACKET DATA

SERVICE DISCOVERY

Agent Reference: PWO-1017

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International Preliminary Examination Authority
European Patent Office
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GERMANY

Dear Sirs

RESPONSE TO WRITTEN OPINION

This is filed in response to the Written Opinion dated June 30, 2004. Please
amend the application as follows under Article 34, and consider the following arguments
and remarks.

AMENDMENTS

IN THE CLAIMS:

Please cancel claims 1 to 10 currently of record and replace with amended
claims 1 to 10 submitted herewith.

IN THE DESCRIPTION:

Please add page 1a submitted herewith to the application.

REMARKS

Amended independent claims 1, 4 and 10 are similar to previous independent claims 1, 4 and 10 but include further limitations. Amended claims 1 to 4, 7, 8 and 10 include minor amendments to the terminology used with respect to blacklists according to the invention. Claim 7 has also been amended to delete the expression "7".

V.1 Novelty and Inventive Step

The Examiner is of the opinion that the mobile device capable of supporting packet data services offered by wireless networks according to former claim 1 is disclosed in D1, and that former claim 1 does not involve any inventive step when considering D1 in conjunction with D2.

Amended claim 1 relates to a mobile device capable of supporting packet data services and voice services. Amended claim 1 specifies that a packet data services blacklist is provided in the memory, and is limited to the fact that the packet data services blacklist is distinct from a voice services blacklist.

D1 does not disclose or suggest a mobile device comprising a packet data service blacklist as described in new claim 1. In fact, D1 is directed to a technique for precluding or rejecting access, in competition areas, to cells of a first operator's network in which access is attempted by or on behalf of a mobile terminal which subscribes to a second operator's network. A restricted cell (which is the cell potentially being protected) is defined in paragraph [0027] of D1 as being any cell of the auxiliary operator network for which the subscription operator network has a competing cell. Accordingly, D1 relates to the forbidding or blacklisting of a cell by a network operator because of political rather than service availability reasons. Although paragraphs [0050] and [0051] of D1 discuss that the network can include a mobile switching center node 18 that provides circuit switched services and an internet connection list oriented network 14 connected to a general packet radio service (GPRS) node 20 tailored to provide packets which type services, no distinction is made between the provision of circuit switched (voice) and packet switched (data) services. Paragraphs [0074] and [0075] of D1 also outline that the

main criterion in determining whether a cell gets rejected consists of comparing the international mobile subscriber identity (IMSI) with other data, such that the determination is based on subscriber identity rather than the availability of packet data services or previous packet data service authentication rejections.   Paragraph [0102] of D1, in describing that invention, describes functions which avoid selecting cells of the competitor's network in the competition area, even though this network is considered "equivalent" from cell selection point of view.   This is different from the situation encountered when using embodiments of the present invention wherein services being provided in a particular cell or location are not equivalent.

Therefore, it is clear that D1 does not disclose or suggest the subject matter of amended claim 1. In particular, D1 does not teach a packet data services blacklist provided in a mobile device's memory, the packet data services blacklist identifying wireless networks that do not provide packet data services to the mobile device, the packet data service blacklist being based on previous packet data service authentication rejections and being distinct from a voice services blacklist. As discussed in the description as originally filed, the present invention seeks to remedy the fact that although roaming agreements may exist with respect to voice services between certain carriers, these roaming agreements do not necessarily apply to packet data services with those same carriers. As such, embodiments of the present invention include a packet data services blacklist that is distinct from a voice services blacklist. Such a provision is not disclosed or suggested in D1.

The Examiner has indicated that considering D1 in combination with D2 would result in a lack of inventive step when considering former claim 1. The Applicant submits that new claim 1 includes an inventive step over D1 and D2. The relevance of D1 has already been discussed. D2 describes a method of automatically establishing a roaming service for a mobile telephone, in particular for a newly powered up device. This method includes receiving a notification and retrieving and sending a list to a newly powered mobile device. The description of D2 mentions different methods of over the air update, which are generally known in the art. The goal of D2 is to provide flexibility to control the order of mobile networks in the location update procedure. In that context, the concept of a forbidden public land mobile network (FPLMN) is discussed in which the

invention of D2 prevents a preferred network from writing onto the FPLMN as a result of transient signalling faults, unsuccessful location update in previous registration and so on. D2 provides a mechanism to ensure a preferred roaming network is selected with a chosen or flexible priority. Network entries which are in the operator list can be removed from a forbidden list after the triggering "after power on/off". D2 does not even acknowledge the possibility of differences in roaming agreements between voice services and packet data services for different carriers. As such, the combination of D1 and D2 does not disclose or suggest a mobile device including a packet data services blacklist provider in the memory, the packet data services blacklist identifying wireless networks but do not provide packet data services to the mobile device, the packet data services blacklist being based on previous packet data services authentication rejections and being distinct from a voice services blacklist.

With respect to the Examiner's allegation that former claim 4 does not involve an inventive step in light of D1 and D3, the Applicant submits that amended claim 4 includes features similar to those in amended claim 1, which provide an inventive step over D1 and D3. Again, the relevance of D1 has already been discussed. With respect to the applicability of D3, although D3 discloses a mobile station having a forbidden PLMN list stored in a memory that is accessible to a mobile station processor, D3 relates only to the erasure of a FPLMN list. D3 does not discuss the criteria for making a network forbidden, nor is there any discussion outside of the selective erasure of a list. Once again, there is no teaching or suggestion that separate packet data services blacklists and voice services blacklists could be stored in the mobile device and that the mobile device would include features according to amended claim 4.

With respect to the Examiner's allegation that former claim 10 does not involve an inventive step in light of D2 and D1, amended claim 10 includes features and limitations as already described in relation to amended claims 1 and 4. As such, the Applicant submits that the arguments provided with respect to the previous claims apply to amended claim 10.

With respect to the Examiner's allegation that the additional features defined in previous dependent claims 2, 3 and 5 to 9 do not add anything of inventive significance to claims 1, 4 and 10 respectively, the Applicant submits that since these claims are now dependent on amended claims 1, 4 and 10 including the additional limitations already described, that the dependent claims do in fact include inventive significance by way of their dependence upon the amended independent claims which themselves include inventive significance. It is submitted that neither of the references D1, D3, D4 or D5 discloses or suggests a mobile device including a packet data services blacklist provider in the memory, the packet data services blacklist identifying wireless networks but do not provide packet data services to the mobile device, the packet data services blacklist being based on previous packet data services authentication rejections and being distinct from a voice services blacklist.

In summary, the difference between the amended claims and to the state of the art (as represented by D1, D2, D3, D4 and D5) is that the amended claims describe a mobile device and a method in which a distinction is made between blacklists used for packet data services and voice services. A packet data services blacklist is provided in the memory of the mobile device, and identifies wireless networks that do not provide packet data services to the mobile device. The packet data services blacklist is based on previous packet data service authentication rejections and is distinct from a voice services blacklist. As noted earlier, prior art mobile devices could not distinguish between roaming agreements based on voice services and roaming agreements based on packet data services. Embodiments of the present invention provide separate blacklists for packet data services and voice services such that enhanced service availability can be provided to mobile users by making this distinction and by maintaining a packet data services blacklist having characteristics as defined in amended independent claims 1, 4 and 10.

Reference signs have been included in the amended claims in the first instance of each element.

New page 1a has been added, acknowledging the cited documents D1, D2 and D3 and briefly discussing them.

In view of the above, the Examiner is respectfully asked to reconsider and withdraw the objections made to this application.

Yours very truly
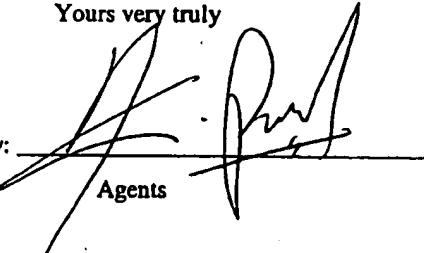
KRISHNA K. PATHIYAL

By: _____

Agents

Enclosures

1. Amended claims 1-10

2. New page 1a

What is claimed is:

1.   A mobile device (104) capable of supporting packet data services and voice services offered by wireless networks, the mobile device comprising:

5   a transceiver for exchanging packet data service authentication information with the wireless networks;

        a memory;

        a packet data services (122) blacklist provided in the memory, the packet data services blacklist identifying wireless networks that do not provide packet data

10   services to the mobile device, the packet data services blacklist being based on previous packet data service authentication rejections and being distinct from a voice services blacklist; and

        a processor for updating the packet data services blacklist in response to newly received packet data service authentication information.

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2.   The mobile device of claim 1 wherein the packet data services blacklist includes an element selected from the group consisting of: a system identifier and network identifier (132) for each wireless network not providing packet data services to the mobile device; a timer value (134) for each wireless network not providing

20   packet data services to the mobile device; an age timer for each wireless network not providing packet data services to the mobile device; and a flag (136) indicating whether an identification of a blacklisted wireless network has been passed to a server.

25   3.   The mobile device of claim 1 wherein the packet data services blacklist includes a composite packet data services blacklist received from a server.

4.   A method of data service discovery for a mobile device (104) having a packet data services (122) blacklist comprising:

30   detecting a wireless network;

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examining the packet data services blacklist stored on the mobile device, the packet data services blacklist being distinct from a voice services blacklist;

if the detected wireless network is listed in the packet data services blacklist, refraining from making any packet data call attempts for a predetermined period of

5   time; and

otherwise, determining whether the wireless network provides packet data services to the mobile device, and adding the wireless network to the packet data services blacklist if the wireless network does not provide packet data services to the mobile device.

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5.   The method of claim 4 further comprising, prior to the step of checking, the step of determining whether the wireless network supports data service.

6.   The method of claim 4 wherein the step of determining whether the wireless

15   network provides packet data services to the mobile device comprises the step of authenticating the mobile device on the wireless network.

7.   The method of claim 4 further comprising a step selected from the group consisting of: starting an age timer associated with a wireless network that is added to

20   the packet data services blacklist; clearing an age timer associated with a wireless network in response to satisfaction of a reset condition; notifying a server of a newly blacklisted wireless network; and receiving a composite packet data services blacklist from a server.

25 8.   The method of claim 4 further comprising the step of clearing the packet data services blacklist in response to a provisioning reset condition.

9.   The method of claim 4 further comprising a step selected from the group consisting of: sending a notification to the server if a mobile device finds a wireless

30   network which was not previously providing packet data services to the mobile

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device and is now providing packet data services to the mobile device; and sending a notification from the server to other mobile devices to clear the entry of a wireless network which was previously not providing packet data services but currently is providing packet data services.

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10. A method of packet data service notification in a wireless network, the wireless network including a server (128) and a mobile device (104), the method comprising:

receiving at the server a registration of a newly powered-up mobile device;

10 retrieving a server-stored packet data services (122) blacklist identifying wireless networks that do not provide packet data services to the newly powered-up mobile device, the server-stored packet data services blacklist being distinct from a voice services blacklist; and

sending the server-stored packet data services blacklist from the server to the

15 newly powered-up mobile device for reception by and storage on the mobile device.

[0004.1]   United States Patent Application Publication No. U.S. 2002/0123348 of Willars et al. published on September 5, 2002 is entitled "Partial Support of Mobility Between Radio Access Networks". This reference is directed to a technique for precluding or rejecting access, in competition areas, to cells of a first operator's

5   network in which access is attempted by or on behalf of a mobile terminal which subscribes to a second operator's network. It relates to the forbidding or blacklisting of a cell by a network operator because of political rather than service availability reasons.   The reference describes functions which avoid selecting cells of the competitor's network in the competition area, even though this network is considered

10   "equivalent" from cell selection point of view.

[0004.2]   United States Patent Application Publication No. 2002/0147012 of Leung et al. published on October 10, 2002 is entitled "Mobile Communications". This reference describes a method of automatically establishing a roaming service for a mobile telephone, in particular for a newly powered up device. This method includes receiving a

15   notification and retrieving and sending a list to a newly powered mobile device. The description mentions different methods of over the air update, which are generally known in the art. The goal is to provide flexibility to control the order of the mobile networks in the location update procedure. It provides a mechanism to ensure a preferred roaming network is selected with a chosen or flexible priority.

20   [0004.3]   PCT Application No. WO 01/05169 of Jultila published on January 18, 2001 is entitled "Mobile Station Controlled Forbidden PLMN List Erasure". This reference discloses a mobile station having a forbidden PLMN list stored in a memory that is accessible to a mobile station processor. It relates only to the erasure of a PLMN list, and does not discuss the criteria for making a network forbidden, nor

25   is there any discussion outside of the selective erasure of a list.